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ORIGINAL RESEARCH

Colonoscopic findings in patients with lower gastrointestinal bleeding and lower gastrointestinal bleeding with alarming features

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ABSTRACT

Background: Lower gastrointestinal bleeding (LGIB) is a frequently encountered condition with diverse etiologies, including both benign conditions, such as hemorrhoids, and malignant ones, such as colorectal cancer. Colonoscopy remains the gold standard for diagnosing LGIB. This study intends to evaluate the colonoscopic findings in patients presenting with LGIB and recognise the impact of alarming features, such as age over 50 years, anemia, weight loss, and family history of colorectal cancer, on these findings. **Objectives:** This study examines colonoscopic findings in LGIB patients, emphasizing on associations between alarming features and serious diagnoses like colorectal cancer. **Methods:** We conducted an observational, cross-sectional study from August 2021 to July 2022 at the Gastroenterology Department of Bir Hospital, Kathmandu. Sixty patients with LGIB were included, with or without alarming features. Statistical analysis was performed using SPSS version 22, and chi-square tests were used to assess correlations. **Results:** Among the 60 patients, 63.3% were male, and the mean age was 47.97 ± 16.22 years. Hemorrhoids (33.3%) and colorectal cancer (21.7%) were the most frequent findings. Alarming features were associated with colorectal neoplasms ($p < 0.05$), predominantly found in the left colon. **Conclusion:** This study shows hemorrhoids and colorectal cancer as leading causes of LGIB. Alarm features strongly correlate with colorectal neoplasms, supporting the recommendation of early colonoscopy in patients presenting with these symptoms.

Keywords: gastrointestinal, bleeding, colonoscopic, colorectal, cancer, neoplasms

INTRODUCTION

Lower GI Bleeding (LGIB) is defined as bleeding that emanates from a source distal to the ligament of Treitz[1]. After the advent of deep enteroscopy small-bowel sources have been placed in the category of midgut bleeding, and a new definition of LGIB has been proposed as bleeding from a source distal to the ileocecal valve.[2]

LGIB is diagnosed in 20% to 30% of all patients presenting with major GI bleeding. The annual incidence of LGIB is 0.03%, and it increases 200 fold from the second to eighth decades of life.[3] Although blood loss from LGIB can range from trivial to massive and life-threatening, the majority of patients have self-limited bleeding and an uncomplicated hospitalization. Compared with acute upper GI bleeding (UGIB), patients with LGIB tend to present with a higher hemoglobin level and are less likely to develop hypotensive shock or require blood transfusions.[4]

Acute LGIB is defined as bleeding of recent duration (<3 days) that may result in hemodynamic instability, anemia, and/or the need for blood transfusion. Chronic LGIB is the passage of blood per rectum over a period of several days or longer and usually implies intermittent or slow loss of blood. Patients with chronic LGIB present with occult fecal blood, intermittent melena or maroon stools, or scant amounts of bright red blood per rectum.

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The most common cause of lower GI bleeds in patients younger than 50 years is anorectal disorders, specifically, hemorrhoids. Inflammatory bowel disease (IBD) and NSAID use should also be evaluated in lower GI bleeds. Most of the data from the west suggests that colonic diverticula are the most frequent source of LGIB followed by angiodysplasias, colitis (ischemic, infectious, chronic IBD, neoplasms and post polypectomy bleeding. Data from India shows that Nonspecific ulcers account for 30% of cases while as the rest are enteric ulcers 15%, tubercular ulcers 6%, neoplasm 6%, amoebic ulcers 6%, angiodysplasia 6% and others.[4]

The etiology and the epidemiology of LGIB depend on the lifestyle, dietary habits, smoking, history of drug intake, age, longevity of the population, etc. The most common cause of LGIB in UK is diverticular bleeding and the second most frequent diagnoses are hemorrhoids, fissures and rectal ulcers.[5] Diverticular disease is the most common cause of LGIB in Brazil, followed by polyps, malignancy, inflammatory bowel disease and angiodysplasia.[6] In Asia, however, colon diverticulosis is not common and is a much less common cause of LGIB. In the Indian experience, the etiology differs significantly. Growth/ polyp are the most common colonoscopy finding in Jammu and Kashmir, India followed by inflammatory bowel lesions.[7]

Patients presented with lower GI bleeding of >50 years of age, the most likely cause was colorectal neoplasm (including colon polyp and colon cancer) and when it was presented in the patients of <50 years of age, the likely causes were hemorrhoid, non-specific colitis, IBD and others. Since colon polyp was found more commonly in the age group of 50-69 years and colon cancer in the age group of 70-84 years, the recommendation of undergoing colon cancer screening by colonoscopy after 50 years of age seems to be valid in our population of Nepal as well, because more detection of polyp at 50-69 age group could prevent the development of more colon cancer at 70-84 years age group. This finding of this Nepalese study emphasize about the need of the screening of colon cancer of average-risk individuals beginning at the age of 50 years, which complies with the standard recommendation.[8]

Clinical features of bowel habit changes and alarming features like anemia , weight loss , family history of colon cancer and age of onset > 50 years should raise suspicion for a colorectal neoplasia and prompt colonoscopy in patients with LGIB.[9] Colorectal neoplasia accounts for up to 17% of all etiologies in patients with LGIB and presents more commonly with occult bleeding.[10] Endoscopic treatment for hemostasis is rarely required because bleeding from colorectal neoplasia is slow in the majority of patients. Patients with occult GI bleeding should undergo colonoscopy for evaluation of underlying colorectal neoplasia.[11] An EGD should be considered if a bleeding source is not identified in the colon, especially in those patients with upper GI symptoms, iron deficiency anemia, or NSAID use. Small-bowel evaluation may be necessary in patients who have fecal occult blood and persistent anemia, after negative EGD and colonoscopy results. [12]

EGD is the initial test in the evaluation of melena as the majority of these patients have UGIB. Melena also may result from slow bleeding emanating from the colon or small-bowel. A colonoscopy should, therefore, be pursued after negative results on EGD. A recent analysis that used the Clinical Outcomes Research Initiative (CORI) database found an increased likelihood of detecting colorectal cancer in patients with melena compared with average-risk screening patients (odds ratio 2.87; $P < .0001$)[12]

Patient with Chronic intermittent passage of small amounts of blood per rectum is the most common pattern of LGIB and usually is caused by an anorectal or distal colon source of bleeding .[13]A digital rectal examination and flexible sigmoidoscopy, with or without anoscopy , may be sufficient for the evaluation of healthy patients aged <40 years.

An emergent EGD is the test of choice for patients presenting with severe hematochezia and hemodynamic instability for the evaluation and management of high-risk upper GI lesions, followed by a colonoscopy after an upper GI source is ruled out. In hemodynamically stable patients with severe hematochezia, colonoscopy should be performed first, followed by an EGD, if the colonoscopy result is negative. The main advantage of colonoscopy lies in the ability to perform a therapeutic intervention in conjunction with diagnosis of the underlying lesion.[1,14]

An urgent colonoscopy is recommended in the evaluation of severe hematochezia and, according to different studies, should be performed within 8 to 24 hours of admission.[14] Early performance of colonoscopy increases both its diagnostic yield and the likelihood of a therapeutic intervention. Endoscopic therapy is performed in 10% to 40% of patients undergoing early colonoscopy for LGIB, with immediate hemostasis being achieved in 50% to 100% of patients.[15]

METHODS

Study Design and Setting

This was a cross-sectional observational study conducted at the Gastroenterology Department of Bir Hospital in Kathmandu, Nepal. The study duration spanned from August 2021 to July 2022, capturing data from patients referred to the hospital for LGIB assessment.

Participants

The study included patients aged 18 years and older who presented with LGIB symptoms. LGIB was characterized by any rectal bleeding, melena following negative esophagogastroduodenoscopy (EGD), or severe hematochezia. Patients were divided

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into two groups based on the presence or absence of alarming features.

Inclusion Criteria

- Patients aged 18 or older presenting with LGIB symptoms.
- Patients with alarming features, defined as:
- Age >50 years
- Anemia
- Unintended weight loss
- Family history of colorectal cancer

Exclusion Criteria

- Known bleeding disorders
- Suspected colonic perforation
- History of upper gastrointestinal bleeding as confirmed by EGD

Procedure

Colonoscopy was performed on all participants by an experienced endoscopist using a flexible colonoscope following standard bowel preparation with split doses of polyethylene glycol (PEG). The Boston Bowel Preparation Scale (BBPS) was used to ensure adequate bowel cleanliness. Participants who did not meet the BBPS threshold were asked to undergo repeat colonoscopy after further preparation.

Data Collection and Analysis

Data on demographic characteristics, clinical presentation, and colonoscopic findings were recorded in a predesigned proforma. Statistical analysis was performed using SPSS version 22, with chi-square tests used to assess correlations between alarming features and colonoscopic findings. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Total 60 patients with Lower GI bleeding were enrolled in this study from September 2021 to August 2022. Out of sixty patients 38 were male and 22 were female (figure 1).

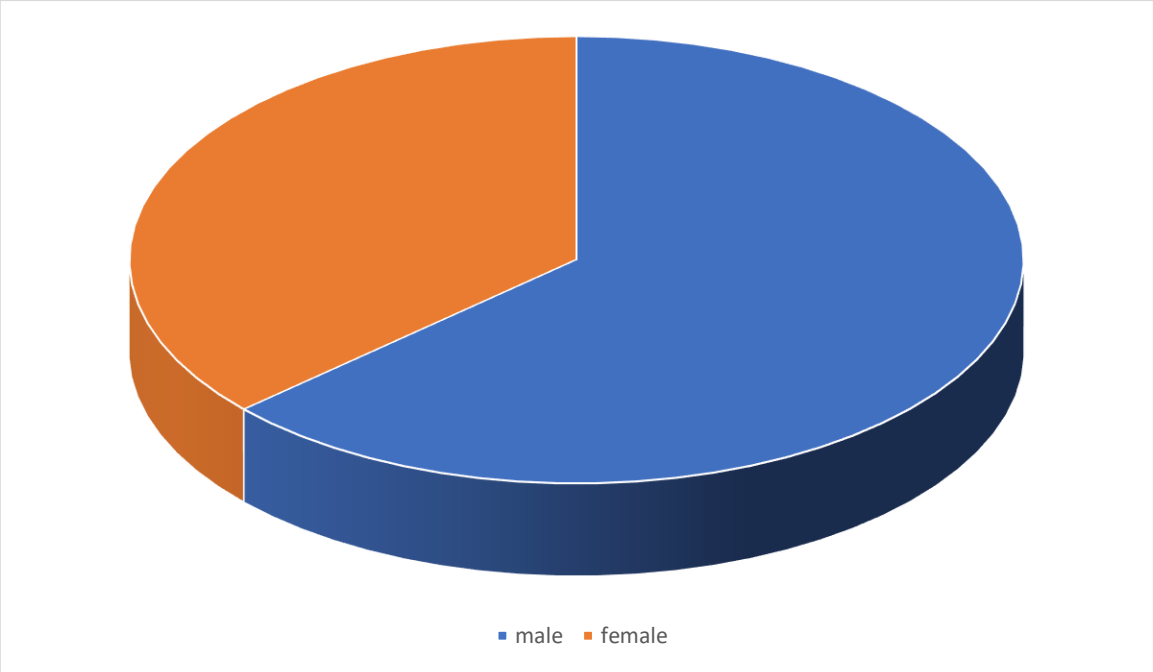

Figure 1: Gender distribution in overall study population

The mean ± standard deviation of age were 47.97 ± 16.22 years. The following table 2 shows the age distribution of patients in two gender groups. There were 36.8% of male patients in the age group of 31-40 years and 31.8% of female patients in the age group of 51-60 years. In ≤20 years of age group there was 1(2.6%) male patient and no female patients in that age group.

Table 1: Age and sex wise distribution of participants

Age in Years	Sex		Total
	Male	Female	
≤ 20	1 (2.6%)	0(0%)	1(1.7%)
21-30	7 (18.4%)	1(4.5%)	8(13.3%)
31-40	14(36.80)	4(18.20)	18(30.00%)
41-50	4(10.5%)	4(18.20%)	8(13.3%)
51-60	59(13.2%)	7(31.8%)	12(20%)

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61-70	3(7.9%)	3(13.6%)	6(10%)
>70	4(10.5%)	3(13.6%)	7(11.70)
Mean ±SD = 47.97±16.22 years			

Pain abdomen was the commonest symptoms presented in 35 (58.33%) of the patients followed by constipation in 13 (21.66%), diarrhea in 11(18.30%), tenesmus in 4 (6.70%), and 1(1.7%) each with vomiting and melena.

Table 2. Symptoms of Patients with Lower GI Bleeding

Symptoms	No of Patients	Percentage
Pain Abdomen	35	58.33%
Constipation	13	21.66%
Diarrhea	11	18.30%
Tenesmus	4	6.70%
Vomiting	1	1.7%
Malena	1	1.7%

*Patients may have one or more symptoms

Etiology of Lower GI bleeding in this study

The commonest etiology of lower GI bleeding in our study was hemorrhoids which was present in 20 (33.3%) patients followed by colorectal cancer 13 (21.7%), normal colonoscopy findings in 10 (16.7%) , colonic polyps seen in 6 (10%), inflammatory bowel disease i.e. ulcerative colitis in 5 (8.3%) , non-specific colitis/proctitis in 2 (3.3%) and diverticulosis , radiation associated vascular ectasia , solitary rectal ulcer syndrome and tuberculosis was seen 1 (1.7%) in each group.

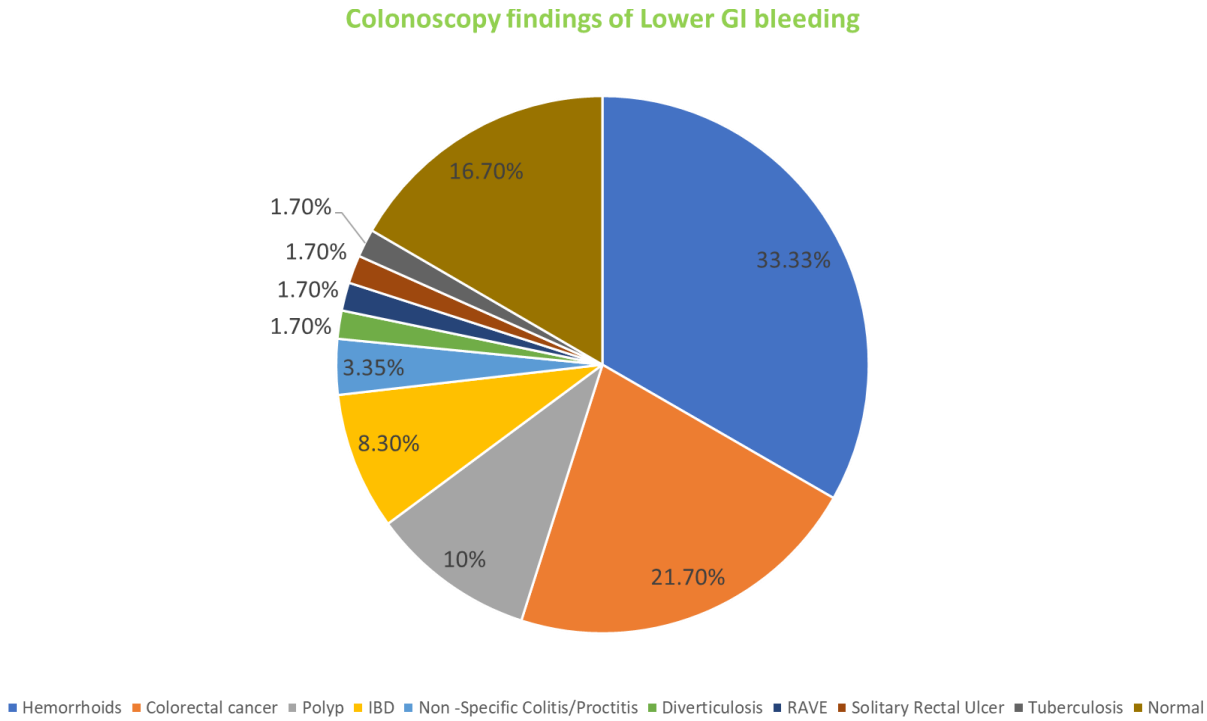

Figure 2. Colonoscopy findings of lower GI bleeding

Alarm features (age > 50 years, anemia, weight loss and family history of colorectal cancer) present in 33 (55%) patients and in 27 (45%) patients without any alarm features. Patients without alarming features 18 (66.7%) were male and 9 (33.3%) were female. Those patients had lower GI bleeding with alarm features 20(60.60%) were male and 13(39.40%) were female) , age was the major contributing factor in 12 patients (5 male and 7 female) followed by age+ weight loss +anemia in 8 patients (5 male and 3 female) , age + anemia in 5 (4 male and 1 female) , weight loss + anemia in two patients (1 male and 1 female) , anemia only in 2 patients (1 male and 1 female) , weight loss only in 2 patients (2 male and none in female) , age + weight loss in 1 (1 male) and family history of colorectal cancer present in 1 male patient.

Of thirty-three patients with lower GI bleeding with alarm features colorectal carcinoma was found in 13 (39.4%) patients, of that 9 (69.2%) patients were male and 4 (31.8%) were female and none of the patient without alarm features were found to have colorectal cancer. In Seven (21.2%) patients with alarm features

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had normal colonoscopy followed by hemorrhoids in six (18.2 %) of the patients.

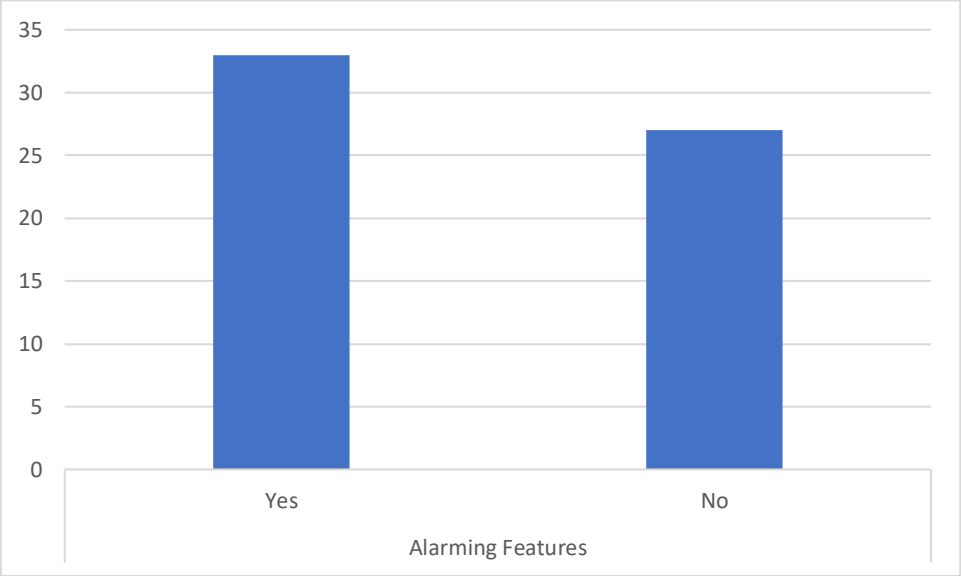

Figure 3 . Lower GI bleeding with or without alarming features.

Table 3. Alarm Features in Patients with lower GI bleeding

Alarm features	Total patients	Male	Female
Age	12(36.36)	5(41.6%)	7(58.4%)
Age +weight loss + Anemia	8(24.24%)	5(62.5%)	3(37.5%)
Age +Anemia	5(15.15%)	4(80%)	1(20%)
Anemia	2(6.06%)	1(50%)	1(50%)
Anemia + Weight loss	2(6.06%)	1(50%)	1(50%)
Weight loss	2(6.06%)	2(100%)	0
Weight loss + Age	1(3.03%)	1(100%)	0
Family H/O CRC	1(3.03%)	1(100%)	0
Total	33	20	13

Table 4. Lower GI bleeding with or without Alarming features according to the sex

Sex	Lower GI Bleeding		Total
	With alarm features	Without alarm features	
Male	20(60.60%)	18(66.67%)	38
Female	13(39.40%)	9(33.33%)	22
Total	33	27	60

Table 5. Lower GI bleeding with and without alarming features according to the age in years

Age in Years	Lower GI bleeding		Total	
	With alarm features	without alarm features		
<= 20.00	0	1(3.7%)	1	p-value
21.00 - 30.00	0	8(29.63%)	8	
31.00 - 40.00	7(21.21%)	11(40.7%)	18	
41.00 - 50.00	2(6.06%)	7(25.92%)	8	
51.00 - 60.00	11(33.33%)	0	12	
61.00 - 70.00	6(18.18%)	0	6	
>71.00	7(21.21%)	0	7	
	33	27	60	0.000

A chi-square test was used to determine association between the alarm features and age, there was a significant association between alarm features with age i.e. p-value=0.000 (<0.05). There were 24 patients above the age of 50 with alarm features group.

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Of all patient presented with lower GI bleeding left colonic lesion was found in 39(65%) followed by lesion in the right side of the colon 6(10%) and 5(8.3%) had lesion in right + left colon. No lesions i.e. normal colonoscopy was found in 10(16.66%) patients.

Table 6. Anatomical location of the lesion in Colonoscopy

Anatomical location of Lesion	No of Patients	Percentage	p-value
Left	39	65	
Right	6	10	
Left +Right	5	8.3	
Normal	10	16.66	
Total	60	100	0.743

Again, lesion on the left side of colon was the commonest in patients with lower GI bleeding with alarming features which was present in 60.60% of followed by the right side of the colon in 12.12 %. The association between Lower GI bleeding and anatomical location of the lesion on colonoscopy was not significant i.e. p-value 0.743 which was > 0.05.

Table 7. Anatomical site of Lesion in colonoscopy with or without alarming features

Site of Lesion	Lower GI bleeding		Total
	With alarm features	without alarm features	
Left	20(60.60%)	19(70%)	39
Normal	6(18.18%)	4(11.11%)	10
Right	4(12.12%)	2(7.4%)	6
Right +Left	3(9.09%)	2(11.11%)	5
	33	27	60

Table 8. Association between colonoscopy findings and alarm features

Colonoscopy findings	Alarm Features		Total	p-value
	Present	Absent		
Hemorrhoids	6	14	20	
Colorectal cancer	13	0	13	
Non-specific colitis/proctitis	0	2	2	
IBD	2	3	5	0.000
Polyp	2	4	6	
RAVE	1	0	1	
Solitary rectal ulcer	0	1	1	
Diverticulosis	1	0	1	
Tuberculosis	1	0	1	
Normal	7	3	10	

There was a significant association between colonoscopy findings and alarm features i.e. p=0.000 < 0.05.

Table 9: Correlation of colorectal cancer with age group.

Age group	Colorectal cancer	Percentage
≤ 20	0	0
21-30	0	0
31-40	3	23.07%
41-50	2	15.3%
51-60	2	15.3%
61-70	1	7.69%
≥ 70	5	38.46%

Colorectal cancer was the second most common cause of Lower GI bleeding in our study presented in 13(21.7%) of the study population. Our results showed that colorectal cancer was more common after the age of 50. However, there were five patients ≤ 50 years age group and highest number i.e. five patients in the age group of ≥ 70. This showed that the prevalence of colorectal cancer increases as age increase and even in patients below the age of 50 the risk of colorectal cancer exists.

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DISCUSSION

Total 60 patients with lower GI bleeding were evaluated by colonoscopy in about 12 months which included the patients admitted to the Department of Gastroenterology by the emergency, outpatient department and referred cases from other units for colonoscopy study were included.

The mean age of our study population was 47.97± 16.22 years. The male gender predominant in our study (63.33 %) and the male to female ratio 1.72:1. Most of the studies have shown that Lower GI bleeding affects Men more commonly than women. which is in accordance with several other studies conducted. In a Nepalese study conducted by Shrestha UK et al, who reported male preponderance with 62.2% of the males and 37.8% of the females in a sample size of 415 patients.[8] In a study by Dar IA et al, Lower GI bleeding was more commonly seen in men as compared to women (59% versus 41%).[7] Tobacco abuse, alcohol consumption, low fiber diet, and reduced fluid intake increase transit time in the colon and retain fecal wastage enhancing the risk of Lower GI bleeding in men.[16]

In a study done by Shrestha UK[8] in 415 patients with lower GI bleeding the different etiologies of LGIB were as following: hemorrhoid 35.2% (male 73.3%, female 26.7%), non-specific colitis 24.8% (male 57.3% female 42.7%), colon polyp 18.3% (male 39.5%, female 60.5%), IBD 10.4% (male 69.8%, female 30.2%), colon cancer 6.5% (male 70.4%, female 29.6%), diverticulosis 1.7% (male 71.4%, female 28.6%), unknown 1.4% (male 50%, female 50%), upper GI bleeding 1.2% (male 60%, female 40%) and radiation colitis 0.5% (male 100%, female 0%). In our study the most common etiology was hemorrhoids which was present in 20 (33.33 %) of the study population followed by colorectal cancer in 13(21.7%) patients ,normal colonoscopy findings in 10(16.7%)patients , colonic polyps in 6 (10%) , inflammatory bowel disease in 5 (8.3%), nonspecific colitis and proctitis in 2 (3.33%) , RAVE in 1 (1.6%) , diverticulosis in 1 (1.6%).

The prevalence of hemorrhoids was similar to the study done by Shrestha UK but the prevalence of colorectal cancer (21.7% vs 6.5%) was more in our study. Colorectal cancer was more in our study because our center is a tertiary center where we get patients from all over the country and increased awareness and availability of colonoscopy facilities has increased since the study done by Shrestha in 2016. Prevalence of diverticular disease and RAVE was low in our study which was similar to the study done by Shrestha. Number of patients with IBD and colonic polyps were slightly higher in his study (10.4% vs 8.3%) and (18.3% vs 10%) respectively than in our study.

The causes of Lower GI bleeding vary from one region of the world to another. In western Europe and the United States, diverticulosis is the most common cause of Lower GI bleeding. Colonoscopy has been shown to accurately identify the source of Lower GI bleeding in more than 80% of patients while also allowing a therapeutic modality at the same time.

In a study done in northern Indian population by Bansal et al[17], the most common cause of lower GI bleed was Hemorrhoids (35.3%) followed by Inflammatory bowel disease (16.3%), Malignancy (12%) and radiation proctosigmoiditis (11.2%).Other findings seen were Infective colitis 22(9.4%), Polyps 12(5.1%), Solitary Rectal Ulcer 10(4.3%), Diverticulosis 6(2.5%), Non -specific ulcers 4(1.7%) and Ischemic colitis 4(1.7%).

As in our study the prevalence of hemorrhoids in that study was 35.3 % of the study population. In their study the majority of the patients were males (69.8%). The mean age of presentation was 46.14 ±19.72 years. Most patients were between 18-30 (25%) years of age. Patients with colorectal cancer were more in our study (21.7% vs 12%) this was mainly because most of our patients were between 31-40 years of age and the risk of colorectal cancer increases as age increases.

Diverticulosis prevalence shows wide geographic and ethnic variability and is considered to be low in the Asian population. In contrast to patients from western countries where bleeding from colonic diverticula is the most common cause of acute LGIB, accounting for approximately 40% of cases[18]. In our study only one (1.6%) patient with diverticular disease presented with lower GI bleeding. The prevalence of diverticular disease increases with age, affecting up to two thirds of people over 80 years old.

Approximately 1% to 17% of acute LGIB results from colonic neoplasms.[18] In our study colorectal neoplasm constituted approximately 21.6% of the findings with lower GI bleeding. 39.4% patients with alarming features had colorectal neoplasm. More than 85% of the tumors are located in the left side of the colon and confirmed by pathology to be malignant. In a study done by Alruzug et al[16] colorectal neoplasm found approximately10% of findings in patients with LGIB and more than 90% of these tumors were located in the left colon. Though the prevalence of colorectal neoplasm is more in our study (21.6% vs 10%), colorectal neoplasm found in the left side of the colon was similar to their study.

Patients with tumors in the right side of the colon are more likely to present with occult blood loss and iron deficiency anemia, whereas those with left sided tumors more commonly present with hematochezia. Since we enrolled all patients with lower GI bleeding colorectal neoplasm predominantly seen in the left side of the colon.

In Shrestha UK study done in Nepal, the prevalence of colorectal neoplasm in his study was 6.5% of the study population, of which 70.4% were male and 29.6 % were female. In our study colorectal neoplasm was found in 21.6% of the study populations and 69.2% were male and 30.8% were female. The male and female ratio was similar with his study but the number

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of colorectal cancers were higher (21.6% vs 6.5%) in our study.

Colorectal cancer was the second most common cause of Lower GI bleeding in our study presented in 13(21.7%) of the study population. Our results showed that colorectal cancer was more common after the age of 50. However, there were five patients ≤ 50 years age group and highest number i.e. five patients in the age group of ≥ 70 In another study done by Hazare et al.[19] in geriatric patients presenting with LGIB, carcinomas were the most common cause for PR bleed 12 (26.6%) cases. The second most common cause was ulcerative colitis and nonspecific colitis. Their study showed that the prevalence of colorectal cancer increases as age increases which was similar with our study and our study also showed that even in patients below the age of 50 the risk of colorectal cancer exists.

A chi-square test was used to determine association between the alarm features and age, there was a significant association between alarm features with age i.e. p-value=0.000 (<0.05). There were 24 patients >50 years of age group with Lower GI bleeding with alarm features and only one patient without alarm features in that same group.

Retrospective study done by Alruzug et.al among 959 Patients from Saudi with Lower GI bleeding 140 (14.6%) had normal colonoscopy findings. In our study ten (16.66%) patients had normal colonoscopy findings which was similar to the study done by Alruzug. Seven (70%) of those were presented with Lower GI bleeding with alarm features.

Urgent colonoscopy following a rapid bowel purge has been shown to be safe, provide important diagnostic information, and allow therapeutic intervention. Because of these features, colonoscopy generally should be the initial modality used for evaluating acute colonic bleeding or severe hematochezia requiring hospitalization. Due to the lack of widespread colonoscopy facilities in our country, only few of our patients had urgent colonoscopy which might be the reason for normal colonoscopy findings in 16.6% of our study population.

CONCLUSION

In this cohort, hemorrhoids and colorectal cancer were the leading causes of LGIB, with males representing a larger proportion of cases. Alarming features were strongly correlated with colorectal neoplasms, particularly on the left side of the colon. These findings underscore the importance of colonoscopy as an early diagnostic tool for LGIB, especially in patients presenting with high-risk features. Larger, multicenter studies could further delineate regional differences in LGIB etiology and help refine screening guidelines

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